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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/488,129

01/20/2000

Patrick W. Mullen

1571.1144001

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05/18/2004

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EXAMINER

CHEVALIER, ALICIA ANN

ART UNIT

PAPER NUMBER

1772

DATE MAILED: 05/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/488,129

Applicant(s)

MULLEN ET AL.

Examiner

Alicia Chevalier

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 11-15, 18, 22-27, 29-49 is/are pending in the application.
- 4a) Of the above claim(s) 34-43 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-6, 11-15, 18, 22-27, 29-31 and 49 is/are allowed.
- 6) ☒ Claim(s) 32, 44 and 46-48 is/are rejected.
- 7) ☒ Claim(s) 33 and 45 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

RESPONSE TO AMENDMENT

1. Claims 1-6, 11-15, 18, 22-27 and 29-49 are pending in the application, claims 34-43 are withdrawn from consideration. Claims 5-10, 16, 17, 19-21 and 28 have been cancelled.
2. Amendments to the specification and the claims, filed on February 23, 2004, have been entered in the above-identified application.

WITHDRAWN REJECTIONS

3. The 35 U.S.C. §102 rejection of claims 44 and 46-48 over Benson et al. (US Patent No. 6,287,670), made of record in paper #25, mailed November 20, 2003, pages 2-3, paragraph #5 has been withdrawn due to Applicant's amendment in the response filed February 23, 2004.
4. The 35 U.S.C. §103 rejection of claims 32 and 33 as over Benson (US Patent No. 6,287,670), made of record in paper #25, pages 3-4, paragraph #6 has been withdrawn due to Applicant's response filed February 23, 2004. Specifically Applicant's arguments on page 9, 5th paragraph regarding Benson not teaching a "retroreflective chips" with a length of less than about 457 micrometers.

NEW REJECTIONS

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Examiner's Comment

6. It is noted that claim 45 uses the term "the first open-faced cube-corner surfaces," and claim 44 from which it depends uses the term "open-faced cube-corner surface." While it is clear that the first open-faced cube-corner surfaces in claim 45 are the same open-faced cube-corner surface of claim 44, it would be clearer if Applicant were consistent with their terminology. It is preferred if Applicant would use "first open-faced cube-corner surfaces" in both claims.

Claim Rejections - 35 USC § 103

7. Claims 32, 44 and 46-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Benson et al. (US Patent No. 6,287,670) in view of Martin et al. (U.S. Patent No. 5,786,066).

Regarding Applicant's claim 32, Benson discloses a retroreflective sheeting (*col. 4, line 17*) comprising a structure (*body layer, col. 4, line 18*) having a plurality of open-faces cube-corner surfaces (*structured surface comprising a plurality of cube corner cavities, col. 4, lines 20-23*) formed therein and a metal layer (*aluminum film, col. 4, line 51*) formed on the surfaces (*col. 4, lines 47-51 and 2*). Benson further discloses that the metal layer retroreflects incident light thereon such that retroreflected light does not pass through the structure, since the reference discloses a top, i.e. front, surface body layer (*col. 4, lines 17-21*) which does not allow incident light to penetrate through the body layer but rather is reflected by the faces forming the cube corner cavities (*col. 1, lines 51-53*).

Benson fails to disclose that the retroreflective sheeting is a chip having a length less than about 457 micrometers.

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Martin discloses a retroreflective structure (*title*) comprising a plurality of cube-corner surfaces (*cube corner prisms, col. 2, line 57*). The cube-corner surfaces are a plurality of very small individual, i.e. chips, retroreflective cube-corner surfaces (*col. 3, lines 34-36*). Martin teaches that each individual retroreflective cube-corner surfaces has a length less than about 457 micrometers, since the reference discloses that the individual retroreflective prisms has a dimensions of less than 0.025 inches (*col. 3, lines 36-37*), which is equivalent to less than 635 micrometers. The individual retroreflective cube-corner surfaces are collected, mixed with paint or a transparent binder and applied as a decorative retroreflective coating to a suitable substrate, such as, fabrics, wood, plastic or metal panels, or the like (*col. 3, lines 37-40*).

Benson and Martin are analogous because they both discuss cube corner retroreflective structures.

It would have been obvious to one of ordinary skill in the art at the time of the invention to make Benson's retroreflective sheeting into individual retroreflective chips with a length of less than about 457 micrometers as taught by Martin in order allow the retroreflective sheeting to be mixed with a matrix.

One of ordinary skill in the art would have been motivated to make Benson's retroreflective sheeting into small chips because it would allow the chips to be mixed with paint or a transparent binder and applied as a decorative retroreflective coating to a suitable substrate, such as, fabrics, wood, plastic or metal panels, or the like (*col. 3, lines 37-40*).

Regarding Applicant's claim 44, Benson discloses a retroreflective sheeting (*col. 4, line 17*) comprising open-faced cube-corner surfaces (*structured surface comprising a plurality of cube corner cavities, col. 4, lines 20-23*) having an optical coating (*aluminum film, col. 4, line*

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51) thereon. The aluminum film is a reflective material (*col. 4, line 47*), thus it produces an optical effect by reflecting light. Benson further discloses that the optical coating retroreflects incident light thereon such that light does not pass through the chip, since the reference discloses a top, i.e. front, surface body layer (*col. 4, lines 17-21*) which does not allow incident light to penetrate through the body layer but rather is reflected by the faces forming the cube corner cavities (*col. 1, lines 51-53*). It is noted that Benson fails to disclose that the retroreflective sheeting are chips having a length less than about 457 micrometers. However, Martin discloses these limitations as addressed above.

Regarding Applicant's claim 46, Benson discloses the sheeting further comprises a color coating on at least some of the surfaces, since the reference discloses a cover layer (*col. 7, line 24*), which is on the cube corner surfaces (*figure 3H*), comprises colorants and dyes (*col. 7, line 35*).

Regarding Applicant's claim 47, Benson discloses the article further comprises a fill layer attached to at least a portion of the optical coating, since the reference discloses that the cavities, i.e. of the cube corner surfaces coated with the aluminum film, can be filled with a fill material to enhance refraction of highly oblique incoming light (*col. 7, lines 40-47*). Furthermore, the fill layer has an index of refraction in the range between about 1.5 and 1.65, since the reference discloses the fill material has a refractive index, i.e. index of refraction, of about 1.5 (*col. 12, lines 47-48*).

Regarding Applicant's claim 48, Benson discloses that the open-faced cube-corner surfaces include different size surfaces on the chips, since the reference disclose that the cube corner elements can be of varying height (*col. 6, lines 32-33*), which directly effects the size of

the surfaces. Furthermore, figures 3E-3H in Benson show that the open-faces cube-corner elements have different size surfaces.

Allowable Subject Matter

8. Claims 1-6, 11-15, 18, 22-27, 29-31 and 49 allowed, having claims 1 and 25 as base claims.
9. Claims 33 and 45 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

REASONS FOR ALLOWANCE

10. The following is an examiner's statement of reasons for allowance:

The closest prior art found is summarized above. The prior art fails to teach or suggest the recited retroreflective sheeting of claim 1 comprising a plurality of first open-faced cube-corner surfaces, of substantially rigid material, disposed of a first side of a carrier substrate with a plurality of second open-faces cube-corner surfaces, of substantially rigid material, disposed on a second side of the carrier substrate and an optical coating disposed on at least some of the first and second cube-corner surfaces, light incident on the optical coating being retroreflected without passing through the substantially rigid material.

The prior art also fails to teach or suggest the recited retroreflective sheeting of claim 25 comprising a plurality of three-sided indentations which form a first open-faced cube-corner surfaces, a second plurality of three-sided indentations which form a second open-faces cube-

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corner surfaces opposing the first open-faced cube-corners and a reflective coating disposed on at least a portion of the first and second three-sided indentations for retroreflecting light that does not pass through the sheeting.

The prior art also fails to teach or suggest the recited retroreflective chip of claim 33 comprising a structure having a plurality of first open-faced cube-corner surfaces formed therein having a length less than about 457 micrometers, a plurality second open-faced cube corner surfaces which oppose the first open-faced cube corner surfaces and a metal layer formed on the surfaces that retroreflects incident light thereon such that retroreflected light does not pass through the structure.

The prior art also fails to teach or suggest the recited retroreflective chips of claim 45 comprising open-faced cube-corner surfaces having an optical coating there on, second cube corner surfaces having specular coating thereon laminated to a back side of the first open-faced cube-corner surfaces such that the respective open-faced surfaces face away from each other, each chip having a length less than about 457 micrometers, and the coating retroreflecting light incident thereon such that light does not pass through the chips.

11. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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ANSWERS TO APPLICANT'S ARGUMENTS

12. Applicant's arguments in the response filed February 23, 2004 regarding the 35 U.S.C. 102 and 103 rejections of record have been considered but are moot since the rejections have been withdrawn.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alicia Chevalier whose telephone number is (571) 272-1490. The examiner can normally be reached on Monday through Friday from 8:00 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached on (571) 272-1498. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Alicia Chevalier

5/17/04